

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An electric motor control apparatus for converting DC electric power into AC electric power of a variable frequency and a variable voltage and performing variable control of an electric motor acting as a load, comprising:

a switching circuit having a semiconductor device ~~such as including~~ a power transistor ~~and a diode connected in parallel with this power transistor,~~

a control part for generating a driving pulse based on an operating frequency signal set by an operating frequency setting part and a carrier frequency signal set by a carrier frequency setting part, and

a driving circuit for amplifying the driving pulse outputted from ~~this the~~ control part and performing on-off control of the power transistor of the switching circuit, the electric motor control apparatus ~~characterized by~~ comprising:

a current computation part for computing an output current from a current flowing through the semiconductor device and also outputting a current breaking signal to the control part when an output current signal computed exceeds a current limit value signal outputted from a current limit level adjusting part,

a temperature change estimation part for estimating changes in temperature of the semiconductor device to compute temperature change amplitude based on ~~this the~~ output current signal, the operating frequency signal and the carrier frequency signal,

a power cycle curve data storage part for storing power cycle curve data showing a relation between the temperature change amplitude and a power cycle life of the semiconductor device,

a thermal stress computation part for converting the temperature change amplitude computed by the temperature change estimation part into the number of power cycles used as the

power cycle life of the semiconductor device by the power cycle curve data and computing a thermal stress signal, and

a life estimation part for doing life estimation of the semiconductor device based on ~~this~~ the thermal stress signal and producing an output to a display part as a life estimation result signal and further calculating life time per set time and comparing the life time with an expected life and outputting an alarm to the display part as a life determination signal when the life time is shorter than the expected life.

2. (currently amended): An electric motor control apparatus as claimed in claim 1, ~~characterized in that it is constructed so that~~ wherein the life estimation part outputs the life estimation result signal and the life determination signal to the current limit level adjusting part and also the current limit level adjusting part makes an automatic adjustment so as to decrease a current limit value signal outputted to the current computation part when alarm information is included in the life estimation result signal or the life determination signal is inputted.

3. (currently amended): An electric motor control apparatus as claimed in claim 1, ~~characterized in that it is constructed so that~~ wherein the life estimation part outputs the life estimation result signal and the life determination signal to the carrier frequency setting part and also the carrier frequency setting part makes an automatic adjustment so as to lower an upper limit value of the carrier frequency and outputs a carrier frequency signal to the control part when alarm information is included in the life estimation result signal or the life determination signal is inputted.